Newsletter of the North American Mycological Association

THE MYCOPHILE

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Regional Trustee Nominations

Every year, on a rotating basis, four Regional Trustee positions are due for nomination and election by NAMA members in their respective region. The following regions have openings for three-year terms to begin in 2016: Appalachian, Boreal, Great Lakes, and Rocky Mountain. The affiliated clubs for each region are listed below; those without a club affiliation are members of the region where they live. Members of each region may nominate themselves or another person in that region. ***Nominations close on October 31, 2015.***

Appalachian
Cumberland Mycological Society
Mushroom Club of Georgia
North Alabama Mushroom Society
South Carolina Upstate Mycological Society
West Virginia Mushroom Club
Western Pennsylvania Mushroom Club

Boreal
Alberta Mycological Society
Foray Newfoundland & Labrador

Great Lakes
Hoosier Mushroom Society
Illinois Mycological Association
Michigan Mushroom Hunters Club
Minnesota Mycological Society
Mycological Society of Toronto
Ohio Mushroom Society
Wisconsin Mycological Society

Rocky Mountains
Arizona Mushroom Club
Colorado Mycological Society

Four Corners Mushroom Club
Mushroom Society of Utah
New Mexico Mycological Society
North Idaho Mycological Association
Pikes Peak Mycological Society
Southern Idaho Mycological Association
SW Montana Mycological Association

Please send the information outlined on the form below to Adele Mehta by email: a.mehta@seniorcommunity.org, or by mail: 4917 W. Old Shakopee Road, Bloomington, MN 55437.

Regional Trustee Nomination Form

Name of Nominee: _____ E-mail: _____
Address: _____ Phone: _____
Region (see table): _____ Club (if any): _____
Brief Bio:

Name of Person Nominating: _____
E-mail: _____ Phone: _____
Region (see table): _____ Club (if any): _____

FORAYS & OTHER EVENTS

This section of **The Mycophile** is reserved for publicizing the annual forays of NAMA affiliated clubs and other events you may be interested in learning about. If you would like us to list your club's next big event, contact us with details you would like displayed here and send to Dianna Smith, editor of NAMA's bi-monthly newsletter, *The Mycophile:* dianna.smith@comcast.net.

September 4-7: COMA's Annual Clark Rogerson Foray will take place again at the Berkshire Hills Emmanuel Camps in the beautiful Berkshires near Copake NY, where Northwest CT, Southwest MA and NY meet. Guests include Gary Lincoff, Dr. Roz Lowen, Bill Yule, Leon Shernoff, Dianna Smith and Larry Evans. Contact Don Shernoff at (914) 761-0323 or via email: donshernoff@yahoo.com.

September 17-20: Wildacres Annual Foray: Please contact Glenda O'Neal by email (glendakoneal@yahoo.com) or by phone (423) 246-1882 for more information.)

September 18-20: **Western PA Mushroom Club's 15th Annual Gary Lincoff Mushroom Foray**. Further information can be found at http://wpamushroomclub.org/.

September 24-27: NAMA Blue Ridge Foray hosted by the Asheville Mushroom Club (AMC) and the Mushroom Club of Georgia (MCG) at the YMCA Blue Ridge Assembly in Black Mountain, NC.

Nominations for President and First Vice President

Current terms for the offices of President and First Vice President expire at the end of 2015. The NAMA Nominating Committee is seeking nominees for these Board positions, each to serve a three-year term, 2016 – 2018. Any NAMA member – including you – may be nominated. These officers will be elected at the upcoming September meeting of the Board of Trustees. Please send the nominee's contact information and a brief bio to Adele Mehta by email: a.mehta@seniorcommunity.org, or by mail: 4917 W. Old Shakopee Road, Bloomington, MN 55437.

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The USDA's first female mycologist: Flora N. Wambaugh

By Emily Geest of the Missouri Mycological Society

Flora N. Wambaugh was born September 15, 1847 to Abram B. Wambaugh and Sarah Fells in the state of Ohio. Her interest in mycology began as a young girl and would continue throughout her life. She received her Bachelor's degree from Antioch College in 1860, followed by a Master's degree in 1865 from Cincinnati Wesleyan College (CWC). A few years after completing her first Master's degree she married Captain Edwin Patterson, and had two sons Edwin M. in 1871 and Harry in 1874. Shortly after her second son's birth, her husband was grievously injured when a steamboat he was on exploded leaving him unable to work. Becoming the sole provider, forced Patterson back into academia where she received her second Master's degree in 1883 from CWC. Patterson then began using her maiden name's initial W, instead of her middle initial N, signing her work Flora W. Patterson. Putting her sons in preparatory school required Patterson to relocate from the mid-west to the east coast but did not stop her from receiving her third Master's degree two years later. This same year (1895) she began working for the USDA as the second woman scientist ever hired and the first female mycologist[3]. In 1915, she coauthored a mycology book titled *Mushrooms and other Common Fungi* with fellow female mycologist Vera Charles. The newspaper, The Washington Star, published a small article on her shortly after showing a photo of the elderly Patterson in a white blouse and dark skirt, as she is glancing downward into a microscope, her white hair tied back in a bun. Beneath this photo it is written, "She knows more about mushrooms, toadstools, and other vegetable fungi than any other person in the whole government service, it is said". She retired from the USDA five years after the article was published at the age of 75, with the title of "Mycologist in Charge of Mycology and Pathological Collection's". She died Feb 5, 1928 in New York and is buried in Fresh Pond Cemetery.

During her lifetime she helped increase the USDA's mycology specimens from 19,000 to 115,000. She published many scientific articles on her discoveries, and was assistant editor of *Economic Fungi*. One lasting impact that is still widely visited today is her guidance in having pest-free cherry trees planted around the white house. These trees still bloom every spring, and are visited during the annual cherry blossom festival that is world-renowned. Born in a time when women could not vote and before the Women's Rights Movement officially started, Flora N. Patterson would do what many could not, and become a successful scientist under her own name rather than her husband's.

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Panellus stipticus

By Jim Cornish

(Article first appeared in *Omphalina*, Vol. V, No. 11, Dec. 2014, newsletter of Foray Newfoundland and Labrador)

Mushrooms are full of surprises, especially when they are discovered for the first time. For me, misconceptions about what might lie hidden on the underside of a mushroom cap is also the cause of surprises. For example, a few years ago I found my first *Panellus stipticus*. It was growing in a cluster on the side of a decaying alder limb partially hidden by the leaf litter blanketing the forest floor. Since the cluster was clearly a wood rotter and resembled bracket fungi, I expected to see something like a typical polypore (no stem and an underside covered with some kind of pores) on the underside. To my surprise, I found something completely different. This experience made it quite clear; naively naming, or even grouping, newly discovered mushrooms based on preconceived notions easily leads to mis-identifications. While such fallacies might be a little embarrassing when identifying mushrooms on a nature walk with a friend, they can be downright deadly when collecting edible mushrooms, particularly those with toxic look-a-likes. Because *Panellus stipticus* taught me something important about studying fungi in the field, it is now one of my favourite mushrooms.

Figure 1: Caps of *Panellus stipticus*

Panellus stipticus (Bull.) P. Karst., commonly called the bitter oyster or the luminescent panellus, has a long taxonomic history. It has been shuffled to and from a number of genera since being first named *Agaricus stipticus* by the French botanist Jean Bulliard back in 1783. Today, *P. stipticus* is the type species of the genus *Panellus*, which includes fifty-five species worldwide. Two accounts of the origin of the name have emerged. One account suggests panellus means "little tumor", while the other suggests it means "little loaf". Both, no doubt, refer to how the mushroom looks on its substrate. The specific epithet stipticus is from the Greek equivalent of the Latin word astringens - any chemical that contracts tissue. Purportedly, *Panellus stipticus* can be used to stop bleeding.

Panellus stipticus is a white rot saprobe that first appears as tiny white knobs on birch and alder in Newfoundland and Labrador, as well as beech and oak elsewhere. As the mushroom matures, the knobs grow into overlapping clusters of fan-shaped caps that are typically convex with incurved and often scalloped margins. Since the mushroom appears bracket-like when viewed from above, at first glance it can easily be mistaken for a polypore. Caps usually measure less than 1-3cm across and are typically dry, off-white to tan in color and covered in fibers. Older specimens often appear scurfy or minutely scaly, giving them a mottled appearance. The mushroom's flesh is thin and although tough, it is quite flexible when wet. The underside of each cap is attached to its substrate by a short, narrow, dull-white stem that is eccentric and tapered toward the base. The stem is typically 0.6 to 1.2 cm long by 0.3 to 0.8 cm thick and covered in white to tan colored wooly fibers. The abrupt line that separates the stem from the gills is clearly visible even without a lens and is a telltale characteristic that separates *P. stipticus* from other members of the genus. The gills are typically pinkish brown, narrow, closely spaced and attached. The spores are white.

Figure 2. Gills of *Panellus stipticus*

Panellus stipticus is an annual, fruiting in the cooler months of the season, and during thaws that punctuate our winters. The mushroom is considered too small and bitter to be edible. Although widely distributed in North America, it is more common in the eastern part of the continent.

Figure 3: **Bioluminescence of *Panellus stipticus*.** The bioluminescent shot was made in a darkened room with a 5 minute exposure. The light exposure lasted 1 second. Photo courtesy of Kent Loeffler, Cornell University.

Panellus stipticus is one of more than 70 bioluminescent species of fungi known to exist worldwide. This bioluminescence results from the oxidization of a pigment known as luciferin by the enzyme luciferase. Studies have shown that peak luminescence occurs at specific hours of the day (late afternoon and early evening) and often corresponds with the mushroom's developmental stages. For the first 6-10 days when it is in its primary growth phase, the mushroom is non-luminescent. During the next 3-5 days of linear growth, it shows a rapid increase in luminescence. This is followed by a quick decline as the mushroom ages. Studies have also shown that luminescence is absent in species outside of eastern North America. It is assumed that bioluminescence in mushrooms attracts insects to aid spore dispersal and attract predators of the insects that frequent and feed on the mushrooms.

Health Benefits of Consuming Tinctures of *Ganoderma* Species?

Editor: I recently contacted Denis Benjamin, author of *Mushrooms: Poisons and Panaceas* **1995, asking him to weigh in on the subject of the validity of various claims regarding the medicinal properties of *Ganoderma lucidum* and its relatives in the genus. I have been concerned that so many people are collecting these bracket fungi and making tinctures for daily consumption based on the belief that doing so will prevent them from developing cancer, diabetes, obesity, colds, and numerous other conditions. His response is featured in the article following my email printed below.**

Hello Denis,

.....I see enormous interest, especially in consuming, growing and selling *Ganoderma tsugae* and *Ganoderma lucidum,* etc. to meet the burgeoning demand for it by particularly, but not exclusively, young people who believe it will boost the immune system and cure or prevent a plethora of maladies from obesity to cancer.

I cannot find conclusive support for these beliefs, which are based on statements in current book after book on medicinal mushrooms. Would you be willing to tackle this subject based on the most current research and also determine if there are any side effects from consuming these polypores, whether in the form of tinctures, teas or any other preparation method on a daily basis?

As an aside, my doctoral studies were on the subjects of premodern science in Europe and China. Ling chi was first mentioned as a drug solely for the emperor, who theoretically could achieve immortality or at least a long life, if taken - in combination with an assortment of other herbs. Obviously it didn't work, although one might argue there are a host of perfectly good reasons for this failure. (I might also mention that in the first century, Chinese alchemists consumed mercury in the belief that it would impart immortality. Of course, they eventually and unfortunately experienced an early and horrible death). In the 12th century, prescriptions including this polypore were used by those literati bureaucrats decided to study medicine to care for their ill family members. *Ganoderma* does not, however, appear to have been a prominently used ingredient in prescriptions. As far as I can tell, it didn't become important until the Chinese, in the interest of accommodating the normal illnesses of its vast population, decided to adopt 'classical medicine'. Western medicine was too expensive, too aggressive, and the Chinese just didn't have the trained doctors to care for their people using a foreign system that seemed suited best for extreme diseases requiring surgery - like cancer. Since then, a vigorous attempt has been made to research some of the drugs found in the pharmacopoeia to determine what accounts for their apparent efficacy. Naturally, there is an interest in showing that their ancient medicine (which is not as ancient as most books declare, nor unchanging over time) is effective and based on experience. Studies in Japan and other Asian countries which adopted the theoretical basis of Chinese medical practices, seem to suggest there is at least a correlation between taking *Ganoderma* and recovering more quickly from radical surgery and chemotherapy.

But if this result proves to be accurate and beneficial, does it mean everyone should be consuming this polypore on a regular basis? I don't think so. It may not be any more dangerous than taking the minimum daily requirements of certain vitamins, which most of us don't need anyway if we eat a healthy and varied diet. And as we know, many vitamins can have deleterious effects if taken in high doses.

If people are so accepting of the efficacy of a presumed ancient unchanging medical tradition based on experience that allegedly goes back thousands of years, then perhaps they might also advocate looking into the few rhinoceros horns still to be seized, since they also have been associated with eternal longevity - for the emperor, and now for anyone who can afford to purchase some of it.

I hope you will consider my suggestion that you write something on this or a more general topic for *The Mycophile*. Thank you.

Dianna
Editor: NAMA's *The Mycophile*
NEMF (Northeast Mycological Federation) President

Ganoderma lucidum

Ganoderma tsugae

A Tincture of *Ganoderma lucidum*

Denis R. Benjamin

A decade ago, during a more strident period, I was discussing so-called 'medicinal' mushrooms with a group of mycologists and mushroom enthusiasts, one of whom I had just met. He pulled me aside and gently informed me that he was a herbalist and routinely used them in his practice. "In fact," he said, "I have been taking reishi for the past year and have not had a single cold." I responded that I had taken nothing, not even a vitamin, and had not had a cold in five years. His eyes twinkled and he said, "You got me." Turns out he had a Ph.D. in organic chemistry and understood the difference between science and story. This interchange encapsulates the fundamental issue around medicinal mushrooms - the yin and yang of believers and skeptics.

I initially resisted the request to discuss the role of *Ganoderma lucidum* (reishi, lingzhi) in human health, suspecting that it was a fool's errand. "For those who believe, no proof is necessary. For those who don't believe, no proof is possible." (Stuart Chase). But I now accept that "Science does not need mysticism and mysticism does not need science, but man needs both." (*The Tao of Physics* - Fridjot Capra)

Advocates of the use of *Ganoderma lucidum* cite a number of claims.

1. It has been used in Asia, especially China, for at least 2000 years.
2. Its names suggest amazing benefits - e.g. Mushroom of Immortality.
3. There are anecdotes of miraculous cures.
4. There is a prodigious body of basic science that certain molecules extracted from the mycelium and/or fruiting body have physiological effects in vitro or in animal models.
5. There are no side effects.

The fact that something has been around for millennia is not proof of efficacy, only is that it is not especially dangerous. The fact that everyone believed the earth was flat for millennia did not flatten it. Neither consensus nor history is reliable *prima facie* evidence. Many substances promoted by ancient folk medicines in both the west and east have been shown to be useless and abandoned. Some were extremely toxic. A few are very valuable. Recall that until the middle of the 20th C, almost all our therapies were derived from the natural world including aspirin (willow bark), digitalis (foxglove), many opioids (poppy), quinine (Chinchoa bark) and ergotamine (*Claviceps*). A plant/animal/fungus deserving our attention from the ethnobotanical evidence may be worthy of scientific scrutiny, but not ex-cathedra pronouncements about their putative benefits. For example, lungwort is not a cure for asthma even if one still believes in the medieval Doctrine of Signatures.

The assertion that lingzhi been used in China for eons can be called into serious question. The records suggest that its use was very limited, primarily restricted to the Emperor and the noble court for most of that time. Only in the 20th Century when cultivation became widespread did it become available to the general population. There is no evidence that it added longevity or decreased illnesses. Chinese have a shorter average lifespan compared to Americans, even with our questionable diet and lifestyle, proving again that epidemiology teaches us little about causation. A skeptic could even use this evidence that Traditional Chinese Medicine (TCM) shortens lives, which would of course be nonsense.

Numerous other nostrums, such as rhinoceros horn, tiger bones, seal and elephant penises, and bear bile, share the same provenance in the Chinese pharmacopeias, resulting in major destruction to wildlife, some to the point of near extinction.They, together with many fungi and plants, are woven into the fabric of a pre-scientific view of anatomy, physiology and pathology with vague assertions of energy flow, various obstructions and imbalances in vital forces. There is no logical reason to select a single agent out of a large pharmacopeia and medical system, in which many herbs/minerals/animal body parts are administered together in complex mixtures, and elevate it to a modern day panacea or general tonic, independent of diet, lifestyle and general cultural beliefs.

Assigning efficacy and function based on traditional names is an example of romantic primitivism. It is no different from Madison Avenue marketing 101. Some cynics have noted that the performance of a product or service is usually the polar opposite from its advertising slogan. And if the truth be known, all the Chinese Emperors who used this fungus have ceased to be, despite the moniker of "immortality".

Perhaps most have heard about a friend or acquaintance who claims that their life was changed, or underwent a seemingly miraculous cure, after taking some preparation of *Ganoderma*. Such anecdotes are powerful in shaping our ideas and beliefs. But the plural of anecdotes is not data. These personal epiphanies can be misleading. Many of the conditions that supposedly benefit have natural histories that wax and wane or spontaneously remit. It is too easy to ascribe these normal variations to some medication or behavior. And at least 30% of improvement may be a result of the expected placebo effect of any therapy. One of great aphorisms in medicine is that the 'best treatment is the tincture of time', probably as effective as a tincture of reishi.

There are over a thousand references in the National Library of Medicine database related to the basic science of *Ganoderma lucidum*. These describe numerous compounds and their effects in various in-vitro experimental models, from cell culture to mice. On the other hand there are less than a handful of human clinical trials, none of which confirm the claims ascribed to it by some. There is some preliminary evidence that it may be useful as an adjunct in certain patients undergoing some forms of cancer therapy. This lack of clinical studies is not surprising, since this is not the way the mushroom is used or intended to be used in TCM. There are no good models for evaluating poly-pharmacy. As most Western medical science is reductionistic and objective there are no satisfactory models for studying general, subjective effects. And because natural products cannot be patented, there is little financial incentive to perform the expensive studies required to demonstrate specific efficacy. Two recent reviews by Leonard come to similar conclusions - there is insufficient clinical evidence to recommend *Ganoderma* for any specific disorder.

The gold standard for any treatment today is the Cochrane Database. This group evaluates all the available published clinical evidence. It is the ultimate equal opportunity critic and routinely casts doubt on many therapies in standard western allopathic medicine. A recent Cochrane review of the use of *Ganoderma* for improving cardiovascular risk factors failed to find significant clinical benefit.

Side effects do occur, but are generally mild and self-limited. However the extent of these is unknown since there is no formal reporting mechanism as there is for pharmaceuticals. It is interesting how practitioners 'spin' the occurrence of these side effects, suggesting that they are the body's appropriate response to rebalancing the various vital forces. In any standard pharmaceutical study, all would be classified as side effects and listed on the package or included in the advertising; they include diarrhea, which can be chronic, skin rashes, bruising and bleeding, hypoglycemia, dry throat, nosebleeds, hypotension, blood in the stool, gastric upsets (nausea, vomiting and diarrhea) and allergic reactions. There are rare reports of serious liver toxicity.

A consideration for those who don't forage their own mushrooms or make their own extracts, is that one has little idea what is in commercially available preparations. There are no established standards. The concentrations of the various compounds are extremely variable, depending on dozens of factors including which part of the fungus is used, how and where it was grown, the substrate, what extraction methods are used among others, with no general agreement of what is optimal. In the past few years, dozens of other Ganoderma laced products have come on the market - chocolates, coffee, hot chocolate, candies, teas, powders, and capsules. The dose, biological activity, side effects or efficacy of these is not subject to any oversight. Caveat emptor. A notable herbalist discusses these issues and the challenge they pose to all potential consumers in FUNGI magazine (Summer 2015).

In brief, *Ganoderma lucidum* contains some very interesting compounds, primarily complex polysaccharides like beta-glucans, and terpenoids. They are worthy of serious study. Whether any will play a significant role in human health has yet to be clinically proven. Everything else is opinion. If you personally feel better and have more 'vitality' with a daily dose of reishi tea, by all means drink up. It is your responsibility to know what you are drinking.

A few very selected references

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Author: Denis R Benjamin spent his professional career as a pediatric pathologist. He is author of http://benjaminwatercolors.com/. He has survived into his seventh decade without taking vitamins. He is interested in good science, mycology and watercolor painting, and is a natural born skeptic. He is currently a Research Associate at the Botanical Research Institute of Texas in Fort Worth.

Remembering Viola Spock

By Anna Gerenday

Viola J. Spock, age 94, died on Wednesday, July 21, 2015 at RWJ University Hospital at Somerset N.J. She was member of the New Jersey Mycological Association (NJMA) and NAMA, and she served as Co-Chair with daughter Melanie, of the Dyeing and Paper Making Committee of both organizations. My first memory of her is her standing behind her color wheel demonstrating wool samples dyed with fungi at an annual Fungus Fest of NJMA. My last memory of her is from the 2011 NAMA Foray in Clarion, PA, by then in failing health. I always liked Viola, a friendly, loving person. I regret not having gotten to know her better.

I exchanged e-mails with her daughter Melanie and asked her about Viola's involvement in the dyeing community:

"Mom started weaving and dyeing in the late 1960's, and then dyeing with fungi in the late 1970's. She knew Miriam Rice, the West Coast expert, from about 1980 or so and attended the first fungi and dye symposium with her in Mendocino.The two became friends and kept in touch over the years. Mom attended workshops taught by Miriam, both dye and papermaking. We also presented dye workshops for NAMA and NEMF, as well as lectured and did demos for garden clubs, senior citizens groups, and other venues. Mom was also a Rutgers University guest lecturer. She did dye demos for NJMA, and was the original co-chair of the committee.

Mom was always eager and willing to share her knowledge of fungi dyes. She was very much loved, considered a dye expert by some Europeans in her many travels, and was always asked to stay with them. We still keep in touch with several of them. When she had knee and later hip surgery, I had to bring a suitcase of her dyed items to the hospital and also to the nursing after-care facilities, so she could show everyone and explain about dyeing and encourage people to join NJMA and NAMA. She also did rug hooking with mushroom dyed wool. At a conference in Cape May, where she brought her mushroom dyed wools, the organizer couldn't believe the colors mom got, and had all the groups come for *impromptu* talks by her."

When Allein Stanley became president of NAMA she recognized Viola "as a spunky and courageous lady [who] knew a lot more about using the mushrooms for dyeing than she ever let on". She asked Viola and Melanie to be co-chairs of the newly erected Dyeing and Paper Making Committee of NAMA.

Viola pursued many interests in her long life, but she was one of the first on east coast to recognize fungi as a potential source of pigment. Her greatest passions were dyeing and teaching her fellow knitters and weavers about them.

Viola J. Spock and daughter Melanie

Dyers' workshop camaraderie. Left to right: Ursula Pohl, Miriam Rice, Viola Spock, Pat Brannen and Carlene Skeffington.

WHO'S IN A NAME?: *Bondarzewia berkeleyi*

By John Dawson, contributor to *NJMA News*, the newsletter of the New Jersey Mycological Association
(part 2 of a series)

In the introductory article of this series I challenged readers to give an example of a mycological binomial in which both the genus name and species epithet are eponyms. The spectacular polypore *Bondarzewia berkeleyi* (Fries) Bondartsev and Singer is one such. "Berkeley's polypore", pictured below and in many field guides is frequently encountered in the east and mid-west. Its large size makes it a memorable find — though perhaps a disappointing one for pot hunters, who may mistake it for the hen-of-the-woods (*Grifola frondosa*), which also fruits in large clusters at the base of living hardwoods.

It was Elias Fries who first described this fungus. He named it *Polyporus berkeleyi* in honor of his eminent British contemporary Miles Joseph Berkeley (1803–1889), sometimes called "the father of British mycology". Then much later, in 1940, the great German mycologist Rolf Singer revised the classification of the Polyporaceae and placed Berkeley's polypore in the new genus *Bondarzewia*, which, together with the family Bondarzewiaceae, he named in honor of a Russian collaborator of his, Apollinaris Semenovich Bondartsev (1877–1968).

(Here a note on spelling and pronunciation is in order. Bondarzew is the German transliteration of the Russian name Аполлинарий Семёнович Бондарцев, whose German pronunciation is the same as that of the English transliteration I have used above [Bon-DAR- tsev]. And since the British pronunciation of the name Berkeley is BARK-lee, the proper pronunciation of Bondarzewia berkeleyi is Bon-dar-TSEV-ee-ya BARK-lee-eye.)

Who were those men, and what did they contribute to mycology?

Berkeley was a gentleman scholar, as most nineteenth-century British scientists were; and like many other such scholars, he was a clergyman by profession. Born in Northamptonshire, he was educated at Rugby and Christ's College, Cambridge, from which he received his B.A. in 1825 and his M.A. in 1828. Ordained as a priest in the Church of England in December of 1827, he became successively curate at St. John's, Margate, Kent, perpetual curate of Apethorpe and Woodnewton, Northamptonshire, and finally vicar at Sibbertoft.

Berkeley's interest in natural history began during his years at Rugby and continued throughout his life. He first published on molluscs, but then, under the influence of J.S. Henslow, turned to cryptogamic botany. His wife Cecelia, whom he married in 1830, was a fine botanical illustrator (as was he), and a linguist as well. She helped to translate and illustrate her husband's botanical publications, the first of which, *Gleanings of British Algae*, appeared in 1833.

Bondarzewia berkeleyi photo by John Dawson

One might suppose that his clerical life gave Berkeley the leisure to pursue his botanical investigations. In fact, however, his appointment provided only a modest stipend and was far from a sinecure. And since he and his wife produced fifteen children, it is no wonder that he found it necessary to run a boys' boarding school on the side in order to make ends meet!

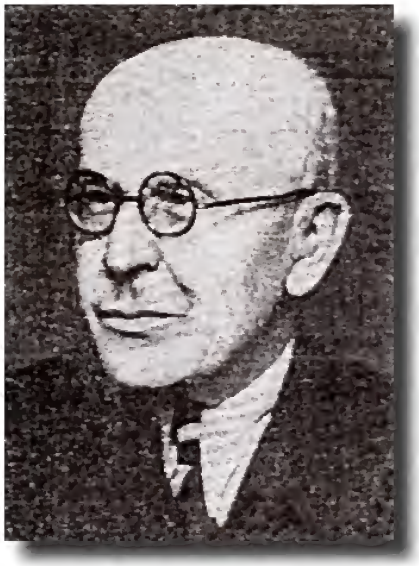
How he found time to carry out research and maintain an extensive correspondence with other mycologists at home and abroad is hard to imagine. Yet his output was prodigious: he wrote over 400 papers on fungi, alone or in collaboration with others (especially C.E. Broome). His mycological reputation was established through the meticulously detailed descriptions of fungi that he contributed to one of the volumes of James Edward Smith's *The English Flora* (1836), and thereafter he became the authority to whom the Royal Botanic Gardens at Kew referred fungal material from all over the world sent there for identification, including that collected by Darwin on the voyage of the *Beagle*.

In the course of his life Berkeley described over 5000 species of fungi (including many from America sent to him by Moses Ashley Curtis) and built up an herbarium of some 10,000 specimens, which he ultimately gave to Kew. But that was not all: the Irish potato famine of 1845 caused him to shift his attention from taxonomy to plant pathology, and it was he who identified the cause of the potato blight (the oomycete now called *Phytophthora infestans*). Subsequently, between 1854 and 1880, he published a long series of articles on pathogenic fungi in *The Gardener's Chronicle*. He was also the first to recognize "the constant presence of basidia [structures that had been discovered earlier by Joseph Henri Léveillé] . . . in a large group of fungi", thereby helping to establish the fundamental distinction between Basidomycetes and Ascomycetes. Berkeley was a much beloved figure, and his portrait confirms the description of him as "a man of splendid presence and great refinement".

The information above is drawn largely from the entries on Berkeley in the *Dictionary of National Biography* and the *Dictionary of Scientific Biography* (from which the preceding quotations are taken). The portrait of Berkeley is from Duane Isely's *One Hundred and One Botanists*, and the cartoon of him from Mary P. English's biography of Mordecai Cubitt Cooke.

Fig. 13.6 The Rev. M. J. Berkeley presiding at a Woolhope Club dinner. (From a cartoon by W. G. Smith, *Graphic*, 1875).

Sources dealing with Bondartsev, on the other hand, are scant. For the details that follow I am indebted to my friend Nancy Tittler of Binghamton, NY, who at my request translated an obituary memoir of Bondartsev that appeared in the Russian journal *Mikologia i Fitopatologia*.



Bondartsev was born ten years before Berkeley's death. He graduated from the Polytechnical Institute in Riga, Latvia, in 1903 and became a government agronomist. Beginning in 1905 he worked at the Central Phytopathological Station in St. Petersburg, and in 1913 he became Director of the Department of Phytopathology at the Botanical Gardens there (later the USSR Botanical Institute). His work in plant pathology included studies of the powdery mildews *Sphaerotheca humuli* of hops and *Sphaerotheca mors-uvae* of gooseberries, as well as the diseases of red clover, hops, and lilacs caused by the pathogens *Botrytis anthophila*, *Septoria humulina*, and *Ascochyta orientalis*, respectively (all of which Bondartsev was the first to describe). In 1912 he published a book on "Diseases of Cultivated Plants and Methods of Combating Them", which for many years was the only textbook in Russian on phytopathology.

In later years Bondartsev became an expert on polypores and "house fungi": those fungi that cause decay of man-made structures. (It is reported that at age 81 he would still climb onto roofs to inspect rotted beams.) He traveled widely throughout the Soviet Union and in 1953 published "Tree fungi of the European USSR and the Caucasus", the definitive monograph on that subject. He maintained a wide network of correspondents and published over 200 articles.

During the siege of Leningrad in World War II Bondartsev remained in the city, where together with V.N. Bondartseva-Monteverde (his wife, presumably) he, like Berkeley, studied diseases of potatoes. And in his later years he published a series of articles on polypores with Margarita A. Bondartseva (his daughter?), who is currently on the staff of the Komarov Botanical Institute of the Russian Academy of Sciences in St. Petersburg, the leading botanical institution in Russia.

Two remarkable personalities, from two different centuries and two different cultures, are thus commemorated in the name of a single familiar mushroom.

NAMA member

Young *Bondarzewia berkeleyi*

NAMA member Roger Wilson of COMA measuring same mushroom
near maturity at 3 feet wide.

A Forest Full Of Pickles

By Dorothy Heal

One beautiful fall day a few years ago, I was collecting small puffballs with my dog Lola. We were in Caledon, Ontario. After being alone for over an hour, scouring the forest floors, I suddenly became aware that I was not the only human in the forest. I looked up and saw a man carrying a large grocery basket heading my way. As my dog ran to greet him we exchanged hellos. He asked me if I was picking mushrooms as well, I said yes and I showed him the puffballs I had collected. The basket he was carrying was filled to the brim with a type of mushroom I was not yet familiar with. I asked him what kind of mushrooms they were and he said he didn't know the name, but that he used them to make 'delicious' pickles. He invited me to come along with him and proceeded to show me the spots where he was picking. He helped me fill up a large bag with his pickle mushrooms and gave me the scoop on how he made his pickles. I thanked him for sharing his knowledge with me. He smiled and said, "The mushrooms grow here on earth for everyone, for the animals and the people, so why keep it a secret... Just don't tell too many people," with a wink.

I was thrilled with my huge bag of mushrooms, but I still had no idea what they were. When I arrived home I did a spore print, and posted some photos of them on some mushroom identification groups on Facebook. With my buff colored spore print, the information from my identification books, and feedback from the Facebook groups I was confident that I had found myself some *Clitocybe nuda* (AKA *Lepista nuda*, blewits).

With this positive ID on the species, I went ahead and tried to make the pickles. Below is the recipe I used, but there are many different variations you could do with this recipe, so get creative! My favorite way to eat them is with a fresh baguette and some nice cheese. Even just dipping the bread in the flavored olive oil is delicious. I also like to periodically top up the olive oil in the jar to extend the flavor and have more oil for dipping.

Fig. 1: A *Clitocybe nuda* specimen destined for the pickle jar!

Wild Blewit Antipasto

INGREDIENTS:

- Blewits (or other choice wild mushrooms)
- 4 parts filtered water
- 1 part vinegar (regular white vinegar works great, but for these I used Bragg's Unfiltered Apple Cider Vinegar)
- 2-3 tsp of salt (or more if desired)
- Garlic cloves cut in chunks (1-5 per jar depending on preference)
- Fresh basil leaves (2-5 per jar depending on preference)
- 1 whole red chili per jar - sliced lengthwise (dried or fresh, you can omit if desired)
- Zest of one lemon
- Olive oil - enough to completely cover mushrooms once they are in jars

DIRECTIONS:

1. Start by chopping your fresh picked blewits (or other wild mushroom of choice) into pieces.
2. Lay mushrooms out flat on cookie sheets lined with paper towels and cover them with the salt; let them sit for 1-2 hours. You will notice a lot of water coming out of the mushrooms; this is good.
3. After 1-2 hours, gently squeeze out any more water you can and move mushrooms into a pot containing the vinegar and water.
4. Bring water to a gentle boil for about 5 minutes. They float so try and ensure all mushrooms get an equal amount of time submerged in the liquid.
5. Remove mushrooms from water and lay them out on the cookie sheets with fresh paper towels. Gently squeeze out as much of the liquid as you can with the paper towels and let them air dry until they are no longer damp. This can take 12-24 hours, or you can use a dehydrator, but keep a close eye on them so they don't dry out completely.

Fig. 2: Boiling the mushrooms.

Fig. 3: The finished product.

6. Once they are sufficiently dry, put them in a bowl and toss them with some of the olive oil. Add lemon zest, garlic and coarsely chopped basil leaves. Toss everything together so mushrooms are evenly coated.
7. Transfer mushroom to sterilized mason jars, also add one red chili per jar.
8. Cover the mushrooms with olive oil so they are completely submerged. Use something to move the mushrooms around in the jars to get any air bubbles out.
9. Seal the jars and refrigerate at least 1-2 weeks before eating.

I hope you enjoy the recipe, and happy foraging everyone!

Dorothy's recipe and photos appeared in *Mycelium*, newsletter of the Mycological Society of Toronto, Vol 4, No. 2, April-June 2015.

BOOK REVIEWS:

California Mushrooms: The Comprehensive Identification Guide
Dennis E. Desjardin, Michael G. Wood, and Frederick A. Stevens
2015, Timber Press (timberpress.com)
ISBN: 978-1-60469-353-9 (560 pages, hardcover)
Price: $60

The literature for identifying California mushrooms is expanding. After 2 or 3 decades of dominance by *Mushrooms Demystified*, *Field Guide to Mushrooms of Western North America* by Michael Davis, Robert Sommer, and John Menge made its appearance in 2012 (reviewed in the March-April 2013 issue of *The Mycophile*) and now, after an unfortunate false start, a substantial effort by three well known San Francisco Bay Area mycologists has entered the field. And that's not all—still another large effort is in the works, covering the mushrooms of the iconic redwood region of coastal northern California and southern Oregon.

Dennis Desjardin is Professor of Biology at San Francisco State University, where he received his master's degree under the supervision of the late Harry Thiers, to whom the book is dedicated. Upon Harry's retirement, Dennis was hired as his successor and has carried on the Thiers tradition of research on fungus systematics and award-winning teaching. Mike Wood and Fred Stevens are long-time members of the Mycological Society of San Francisco who also were influenced heavily by Thiers and have played important roles in the annual field course held at the University's Sierra Nevada Field Campus, both during the Thiers years and later during the courses taught by Desjardin. Wood also is the creator of (and Stevens an important contributor to) the popular website, *MykoWeb*, an excellent source of information on the mushrooms of California and beyond.

This book is rightfully entitled an "identification guide," rather than "field guide." It is large, 8½ × 11 inches (280 × 215 mm), heavy, and much too pretty to expose to rain and mud in the field. The contents consist of pretty much the standard stuff one finds in mushroom guides but in a larger format. The front matter includes the dedication, acknowledgments, introduction, and suggestions on how to identify mushrooms and how to use the book. The introduction includes sections on what fungi are, the authors' philosophies and other matters related to why the book is what it is, nomenclature and taxonomy, morphology and phylogeny, biology of mushrooms, mushroom ecology, when and where to find mushrooms, and edible and poisonous mushrooms. The nomenclature and taxonomy, and morphology and phylogeny, sections, which aren't included in most guides, should be particularly helpful for understanding why there is such a high rate of change in mushroom names. It isn't simply to frustrate field mycologists.

The back matter includes a glossary; lists of plant names arranged by common name, literature cited, and California mushroom clubs; photo credits; and index.

According to the publisher's blurb, 650 species are profiled and another 450 are briefly described or at least mentioned (out of a very conservatively estimated 3000 species in the state, so publisher please note that the book actually isn't "comprehensive"). The mushrooms section opens with a key to the main body forms or morphotypes.

Each of the types is illustrated with a thumbnail photo of a typical member of the group. The gilled fungi are further broken down by spore color group. Further keys to the genera, or multi-genus groups (such as chanterelles, lepiotoid, and tricholomatoid), and to the species in those groups include only the 650 featured species. They are based on macro features and ecology and appear to be workable, although the authors rightly warn that coming to an answer in the key does not mean one has successfully identified the mushroom, as it could belong to a species not included in the book. Thus one should keep an open mind and not try to force a fit.

Each genus, or other group, is introduced with a general discussion that precedes the key to the species in that group. The species profiles follow, in alphabetical order. Each one includes the scientific name with author; common name if it has a widely used one; short list of selected synonyms or misapplied names if there are any; descriptions of cap, hymenophore (the authors don't shy away from using technical terms), stipe, odor, taste, spores and other micro-features, habitat, and edibility; and a useful comments section with additional information, comparison with closely related or similar species, indication of the existence of undescribed species, and so forth. Each profile includes a generously sized (mostly about 4-3/4 × 3-1/4 inches), good-to-excellent quality photograph (in some cases, two photos are provided). Wood and Stevens provided the bulk of the photos, with Desjardin and 21 other photographers contributing additional images. The "false start" mentioned in the opening paragraph involved a reprinting of the book (delaying its release by almost a year) to correct the overly dark appearance of many of the photographs. The affected photos look much better in the reprinted version, although now some photos that I thought looked fine are a bit on the bright side. If it's not one thing …

The design is attractive and the production quality of the book is high—it is sturdily bound and I spotted only a tiny number of errors. However, no book is perfect and I must take issue with a few of the authors' statements concerning distributions and relatedness. A number of the species are claimed to be "endemic," that is to occur in California and nowhere else. We simply know too little about the distributions of mushroom-fungi to make such assertions confidently and, to illustrate, two of the supposed endemics (*Hygrocybe virescens* [see *Mushrooms of the Pacific Northwest*, p. 65] and *Tricholoma dryophilum* [fide Dr. Michael Beug]) have been found in Washington state. Other species are said not to exist in California and these claims probably are true. But it is impossible to prove a negative and one never knows when a surprising first find might be made, especially when the mushroom-fungi spend most of their time out of sight. Better to say that such species are not known from, or have not been recorded from, the state. And finally, there are statements about two mushroom species being unrelated. If one accepts the fact of evolution, and I am pretty sure that the authors do, then all organisms are related and it's merely a matter of how closely or distantly. So please say "not closely related" rather than "unrelated." Of course, such quibbles have little bearing on the main purpose of the book—to provide a means for identifying the fungi—and it will serve that purpose very well.

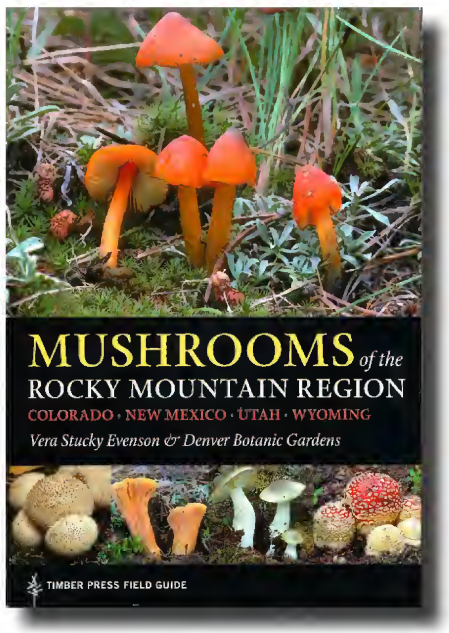
At $60, the book isn't cheap, but it offers good value. It's an excellent addition to the mushroom literature for the West Coast and should be in the library of all who would attempt to identify the mushrooms of California or surrounding areas.

Steve Trudell

Correction: In the May-June 2015 issue of *The Mycophile*, the review of *Field Guide to Tropical Amazon Mushrooms* by Daniel Winkler and Larry Evans (2014) mistakenly listed the publisher as Habour Publishing, the company that published Winkler's earlier guides. This book was actually self-published as Mushroaming Publishing. The website for ordering this book (www.MushRoaming.com) is accurate.

Mushrooms of the Rocky Mountain Region: Colorado, New Mexico, Utah, Wyoming

Timber Press Field Guide
Vera Stucky Evenson and Denver Botanic Gardens
2015, Timber Press (timberpress.com)
ISBN: 978-1-60469-576-2 (298 pages, plasticized softcover)
Price: $27.95


MUSHROOMS of the
ROCKY MOUNTAIN REGION
COLORADO · NEW MEXICO · UTAH · WYOMING
Vera Stucky Evenson & Denver Botanic Gardens
TIMBER PRESS FIELD GUIDE

When the review copy of this new Timber Press release arrived, I was surprised to see a very familiar-looking book—the size, binding, and cover bear a striking resemblance to *Mushrooms of the Pacific Northwest*, a book that I know quite well. So what began as Timber Press's series of field guides for the Pacific Northwest (also including volumes on wildflowers, trees and shrubs, wildlife, and insects) now has expanded to other parts of western North America. Once I began to peruse the contents, it again seemed familiar, but for a different reason. This is a slightly revised and slightly enlarged version of *Mushrooms of Colorado and the Southern Rocky Mountains*, published by the Denver Botanic Gardens (hence the unusual inclusion of an institution as co-author), Denver Museum of Natural History, and Westcliffe Publishers in 1997 (long-time NAMA members, see review by Dr. Cathy Cripps in the September-October 1997 issue of *The Mycophile*).

Although the format is different, the content of this new version is not much changed from the earlier version. One hundred ninety-two species are described and illustrated, and another 16 are mentioned in comments and illustrated (not sure where the book-jacket claim of "more than 220 species" came from), whereas only about 170 species were covered in the original version. A number of the names have been updated, such as those of the inky caps (formerly all in the genus, *Coprinus*), *Boletus rubriceps*—the red-capped Rocky Mountain member of the *B. edulis* group—and *Armillaria solidipes* (one of the honey mushrooms, previously known in North America as *A. ostoyae*; however a few others, such as *Turbinellus (Gomphus) floccosus*, were missed. Some of the observations sections also have been updated.

After a pair of dedications—the 1997 one to Dr. Sam Mitchel, for whom the fungus herbarium at the Denver Botanic Gardens is named, and the 2015 one to Ms. Rosa-Lee Brace, a long-time volunteer and mainstay at the herbarium—and the usual front matter, the introduction includes sections on mushroom anatomy and names, how to use the book, reproduction and lifestyle, habitats and fruiting times, collecting mushrooms, and have fungi, but be careful! An interesting and helpful feature is a list of figures and photographs in which the Botanic Gardens' accession numbers of the photographed collections are given, so an interested party could find the actual material for further study if desired.

The back matter includes a glossary, list of suggested readings, photo and illustration credits and the index.

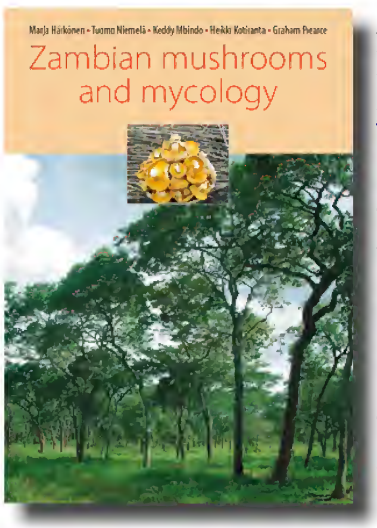
As in the original version, there is a pictorial key to the main morphologic groups inside the front cover and the groups are indicated by color coding at the tops of the pages. Unfortunately, the color codes are not included in the pictorial key, although page numbers for the sections are provided. Further keys to the genera (or "genus and allies") are provided, but there are no keys to species, which is fine, given the small percentage of the Rocky Mountain mushrooms that are included in the book. Having keys to the species in the book would only result in a large number of false-positive identifications.

The species are listed by scientific name, including author. The headings also include brief synonyms, common name (if a widely used one is available), order, family, and a nutshell description. The main descriptive text covers

a fruiting body (cap, gills, stalk, and flesh, or other characters appropriate to the group being considered), spores, ecology/fruiting pattern, (meaning of the) specific epithet, and observations. Each description is accompanied by a good-to-excellent quality photo of mostly generous size (many are 4-5/8 × 3 inches and a few are even larger). This is a welcome difference from *Mushrooms of the Pacific Northwest*, where most of the photos were too small to be as effective as they could have been.

It's great that this long out-of-print guide is once again available and it should be an easy purchasing decision for folks who lack the earlier version. For those fortunate enough to have the original, you'll have to decide whether having an increased number of species (roughly 15%) and a lot of updated names justifies the expense.

Steve Trudell



Zambian mushrooms and mycology. 2015. Marja Härkönen, Tuomo Niemelä, Keddy Mbindo, Heikki Kotiranta, and Graham Piearce. Finnish Museum of Natural History (Botany Unit), Helsinki. Norrlinia 29. http://www.luomus.fi/en/botany-unit-0. ISBN: 978-951-51-0852-4. 207 pp, 276 color images. Price € 57 (paperback).

The book contains a wealth of information, technically accurate mushroom pictures and a series of concise line drawings.

Since it brought together anthropologists, foresters, ethnobotanists, mycologists, chefs and teachers the result is an eclectic array.

The major sections of the book are 1) An introduction to mycology for beginning students (including an illustrated glossary). 2) How to collect, identify and study fungi (evaluation of macroscopic and microscopic features). 3) Technical descriptions of over 90 species. 4) The importance of the major vegetation types in Zambia to the wild mushroom crop (ecology of the fungi especially edible species and how mushrooms keep the prevalent Miombo forests, typified by ectomycorrhizal Brachystegia species, healthy). 5) Evaluations as food of the common edible and poisonous mushrooms used or not by various tribes, and 6) The traditional ways of using mushrooms, importance as a source of food, and 20 mainly Zambian recipes.

To encourage the inclusion of mushrooms in meals a number of recipes obtained from local cooks are detailed as is preparation using the traditional Zambian open fire between three stones. Common names, edibility, local collecting techniques, and receipts were compiled from interviews primarily in rural areas with elders, chefs and family cooks.

The technical descriptions can be used as a field or identification guide. Identifications will often be made when the mushroom in hand is compared with the excellent photographs. Most of the generic names will be familiar to readers; included are 3 species of *Agaricus*, 12 *Amanita*, 9 *Lactarius*, 9 *Russula*, 10 *Termitomyces*, 6 *Cantharellus*, 6 boletes and 22 polypores.

The multipurpose style of this book with clear details of techniques in the sections designed for introductory students to the culinary uses of mushrooms to more technical aspects of ecology and mushroom taxonomy provide readers of various interests with some new or distinct views.

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Newsletter of the North American Mycological Association
THE MYCOPHILE

Mushroom of the Issue

Coltriciella dependens
Photo and Text by Tom Bigelow of NYMS

Coltriciella dependens, Devils Den Preserve, Weston, Connecticut, June 13, 2015

William Chambers Coker described the polypore *Coltriciella dependens* as a "rare and odd little plant." While 'odd' and 'little' are apt epithets, it is surely more elusive than rare, due to its diminutive size (the one pictured here being ¼" across) and its growth habit on the underside or in hollow cavities of well-rotted wood. It has a unique, pendant growth habit, dangling from the substrate, looking very much like a tiny upside-down *Coltricia* with pores on the top surface. It also bears an uncanny resemblance to a tiny wasp's nest. My wife Juniper has found it several times this year – in Weston, Connecticut in oak, and several collections from Concord, Massachusetts in white pine. In one collection, six or seven individual caps fused to create a behemoth nearly 3" long.